CLAIMS

What is claimed is:

1.   A method for dynamic distributed link table consistency management, the method comprising:

5   (a)   maintaining, on a plurality of different link interface modules in a distributed signaling message routing system, a plurality of signaling link tables having the same signaling link entries;

       (b)   sending a signaling link table error detecting code request from a first link interface module having a first signaling link table to a

10   second link interface module having a second link interface table;

       (c)   at the second link interface module, in response to the request, computing an error detecting code for the second signaling link table and sending the error detecting code to the first link interface module;

15   (d)   at the first link interface module, computing an error detecting code for the first signaling link interface table and comparing the error detecting code computed for the first signaling link table to the error detecting code received from the second link interface module;

20   (e)   in response to detecting a match between the error detecting codes, repeating steps (b)-(d) for the next link interface module in the system; and

       (f)   in response to failing to detect a match between the error detecting codes, taking corrective action.

2.   The method of claim 1 wherein maintaining a plurality of signaling link tables includes maintaining a plurality of SS7 signaling link tables.

3.   The method of claim 1 wherein maintaining a plurality of signaling link tables includes maintaining a plurality of IP socket tables.

5   4.   The method of claim 1 wherein taking corrective action includes:

at the first link interface module:

(a)   sending an individual entry error detecting code request from the first link interface module to the second link interface module;

(b)   receiving the individual entry error detecting code from the

10   second link interface module and computing an individual entry error detecting code for an entry in the first signaling link table;

(c)   comparing the individual entry error detecting code received from the second link interface module to the error detecting code computed for the individual entry by the first link interface

15   module;

(d)   in response to detecting a match of the individual entry error detecting codes, repeating the individual entry checks for each entry in the first signaling link table; and

(e)   in response to failing to detect a match between individual entry

20   error detecting codes, performing a predetermined corrective operation.

5.   The method of claim 4 wherein performing a predetermined corrective operation includes reporting the individual entry mismatch to an operator.

6.   The method of claim 4 wherein performing a predetermined corrective operation includes correcting at least one of the individual entries.

7.   The method of claim 6 wherein correcting at least one of the individual entries includes correcting the entry in the first signaling link table to match a corresponding entry in a signaling link table on a link interface module that terminates the signaling link corresponding to the entry.

8.   The method of claim 7 wherein correcting at least one of the individual entries includes correcting link status information in the entry in the first link interface table.

9.   The method for dynamic, distributed link table consistency management, the method comprising:

(a)   broadcasting a signaling link table error detecting code request from a first link interface module having a first signaling link table to a plurality of second link interface modules having second signaling link tables;

(b)   receiving full signaling link table error detecting codes from the second link interface modules;

(c)   comparing the received error detecting codes to a full signaling link table error detecting code computed for the first signaling link table;

(d)   requesting individual entry error detecting codes from the second link interface modules having full signaling link table error detecting codes that do not match the full signaling link table error detecting code computed for the first signaling link table;

(e)   receiving the individual entry error detecting codes from the second link interface modules having full signaling link table checksums that do not match the full table error detecting code computed for the first signaling link table and comparing the individual entry error detecting codes to individual entry error detecting codes computed for the first signaling link table; and

(f)   taking corrective action for the mismatching entries.

10.   The method of claim 9 wherein broadcasting signaling link table error detecting code requests to a plurality of second signaling link interface modules includes broadcasting link table error detecting code requests to a plurality of SS7 signaling link interface modules.

11.   The method of claim 9 wherein broadcasting signaling link table error detecting code requests to a plurality of second link interface modules includes broadcasting the link table error detecting code request to a plurality of SS7 over IP signaling link interface modules.

12.   The method of claim 9 wherein taking corrective action includes informing an operator of mismatching signaling link table entries.

13.   The method of claim 9 wherein taking corrective action includes automatically correcting the mismatching entries.

14.   The method of claim 13 wherein automatically correcting the mismatching entries includes identifying the owner of a signaling link table entry and requesting current link table entry status information from the owner.

15. A system for dynamic, distributed link table consistency management, the system comprising:

    (a)   a plurality of link interface modules for sending and receiving signaling messages from external signaling links;

    (b)   a plurality of link tables, one link table being located on each link interface module, each link table including entries having signaling message routing information and corresponding signaling link status information; and

    (c)   a plurality of dynamic link table auditors, one link table auditor being located on each link interface module, each dynamic link table auditor being adapted to compare the link table on its associated link interface module with the link tables on other link interface modules and to take corrective action in response to inconsistencies between the link tables.

16. The system of claim 15 wherein the link interface modules include SS7 link interface modules.

17. The system of claim 15 wherein the link interface modules include SS7 over IP signaling link interface modules.

18. The system of claim 15 wherein the link tables on each of the link interface modules include corresponding signaling link entries.

19. The system of claim 15 wherein the dynamic link table auditor on each link interface module is adapted to broadcast link table error detecting code requests to the other dynamic link table auditors in order to check

for inconsistencies in signaling link status information between the link

tables.

20.   The system of claim 15 wherein the dynamic link table auditor on each

link interface module is adapted to sequentially request link table error

5   detecting codes from the other dynamic link table auditors in order to

check for inconsistencies between the signaling link tables.

21.   The system of claim 15 wherein the dynamic link table auditor on each

link interface module is adapted to check for inconsistencies between

individual entries in the signaling link tables.

10 22.   The system of claim 21 wherein the dynamic link table auditor is

adapted to report inconsistencies in individual link table entries to an

operator.

23.   The system of claim 21 wherein the dynamic link table auditor is

adapted to automatically correct individual signaling link table entries for

15   which inconsistencies are detected.

24.   The system of claim 23 wherein, for each individual entry for which an

inconsistency is detected, the dynamic link table auditor is adapted to

identify the owner of the mismatching entry and correct its link table

entry to correspond to that of the owner.

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